

Interconnection Rules for Distributed Generation

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Public Service Commission of Wisconsin

DER Road Show
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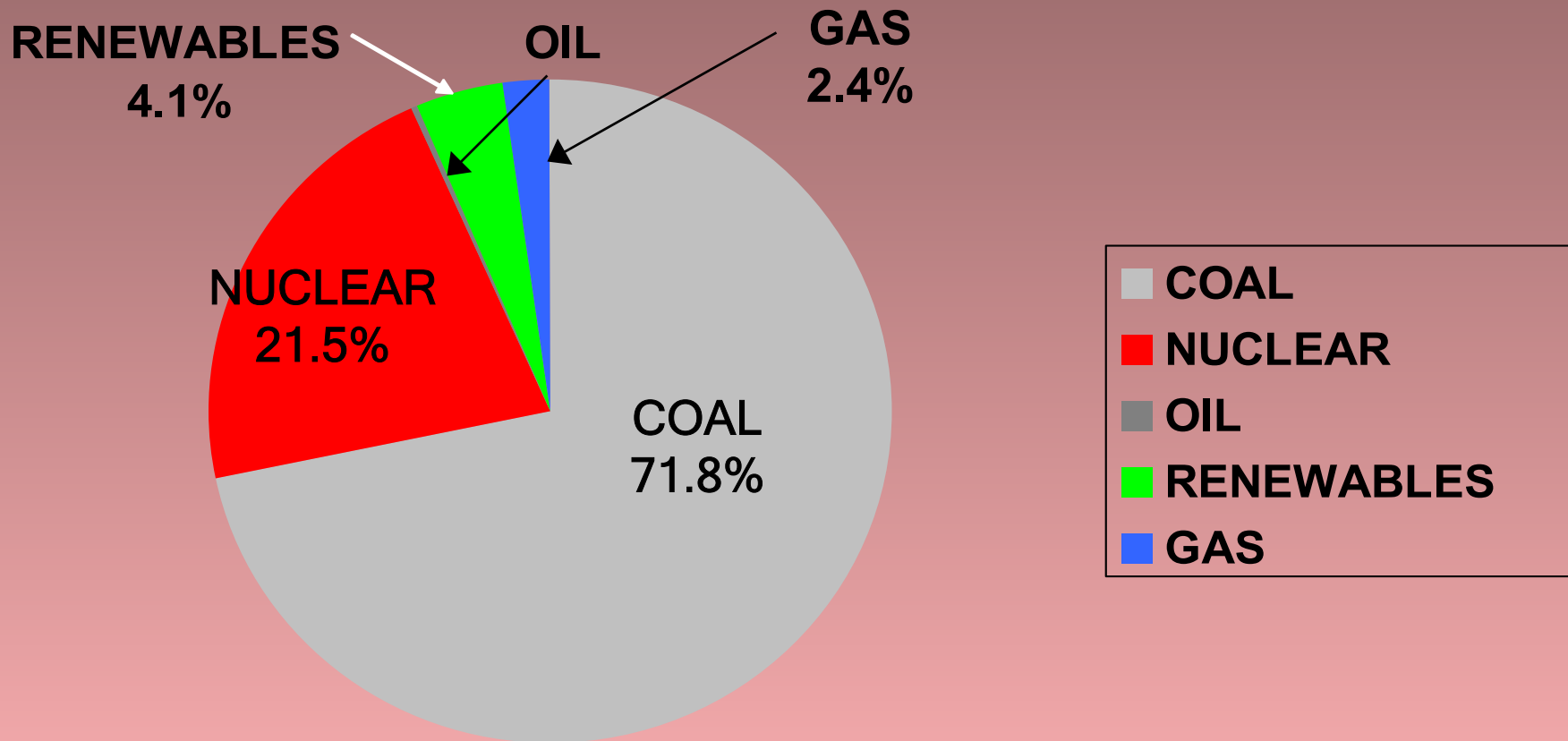
Interconnection Rules for Distributed Generation

1. What is DG?
2. Why does the State have an interest?
3. Timeline for PSC 119
4. What is in the Draft Rules?
 - Size categories
 - Standard application
 - Fees
 - Application process

What is Distributed Generation?

1. Electric generation located at or close to the point of use.
 2. Alternative to Central Station generation.
- Solar
 - Wind
 - Fuel Cell
 - Micro-turbine
 - Small I.C. Engine
 - Gas Turbines

Wisconsin Electric Production By Fuel Type in MWH



Why Distributed Generation?

- Reliability
- High Quality Power
- Reasonable Priced
- Reduce need for new Transmission
- Can reduce air emissions and CO₂

* DENMARK last year reduced CO₂ by 7% while economy grew by 2.4%!

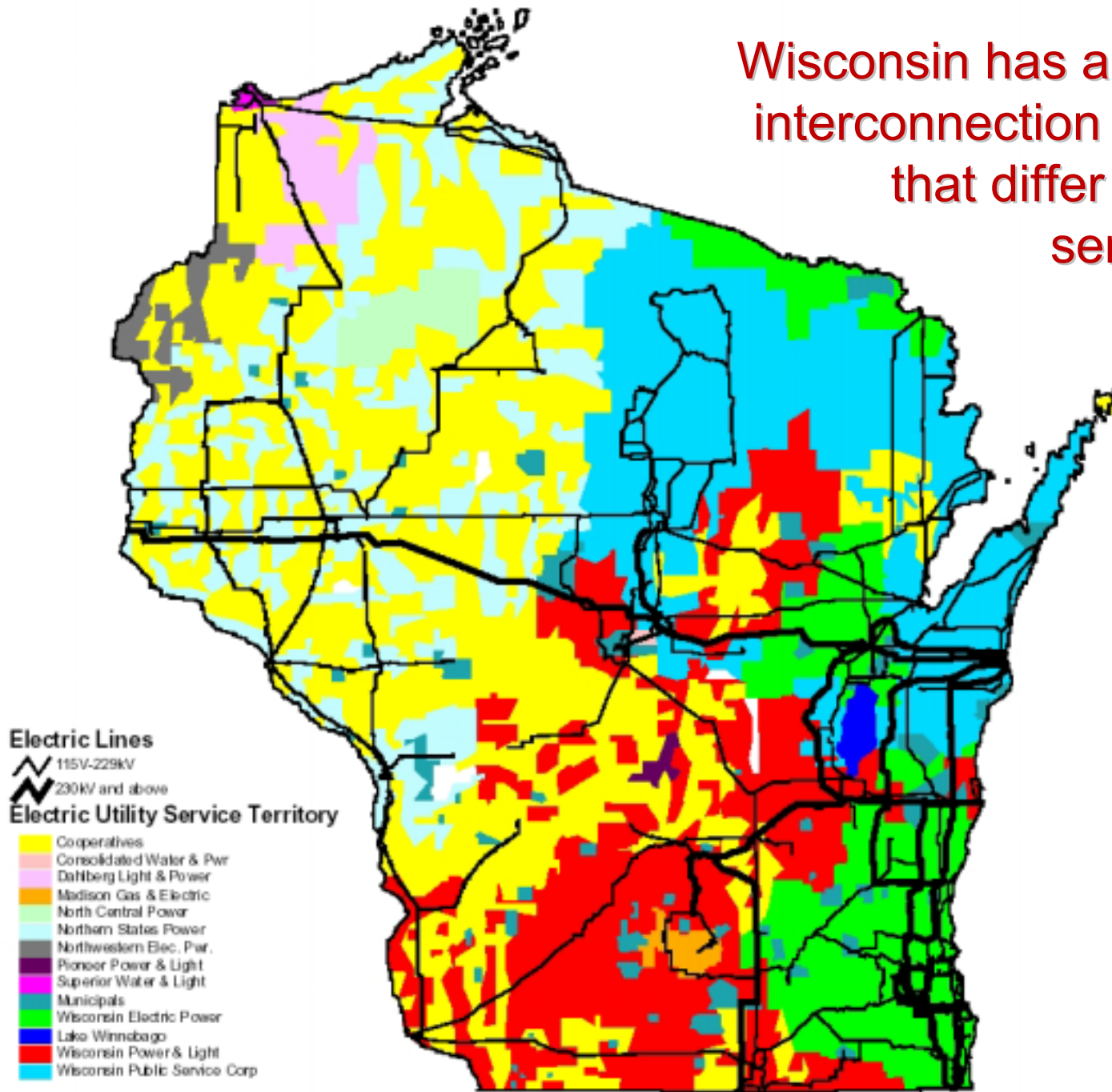
§ 196.496 DISTRIBUTED GENERATION

- Defines DG to include facilities up to 15 MW
- Located at a point where electricity will be used OR at a location that will support the electric distribution grid
- Directs the PSC to develop rules establishing standards for interconnection

§ 196.496 DISTRIBUTED GENERATION

- Standards shall be uniform and promote distributed generation
- Standards shall address engineering, electric reliability safety concerns, and methods for determining the charges to interconnect
- Formation of advisory committee

Wisconsin has a patchwork of interconnection requirements that differ in each utility service territory.



Rulemaking Timeline

Schedule

Action

August 8, 2001

Open docket 1-AC-207

February 2002

Establish Advisory Committee

February to
June 2002

Hold meetings of Advisory
Committee

July to
December 2002

Prepare draft rules and submit
to Commission for review

Schedule

Action

March 3, 2003

Public Hearing in Madison

March 2003

Close the record and prepare final draft

June 2003

PSC order adopting final rules

June-July 2003

Review by Legislative committee (30 days)

August 31, 2003

New rules become effective

PSC 119 – Rules for Interconnecting DG Facilities

- ★ ONE Designated contact at each utility
- ★ Standard application and agreement forms
- ★ FEES by category:
 1. \$0 for 20kw and under
 2. \$250 + engineering fee (\$500 max)
 3. \$500 + engineering review fee based on cost
 4. \$1000 + engineering review fee based on cost
- ★ Utility may charge DG for system upgrades (2-4)

PSC 119 – Rules for Interconnecting DG Facilities

Categories:	Size
1	< or = 20kW
2	> 20 kW to 200 kW
3	> 200 kW to 1 MW
4	> 1 MW to 15 MW

PSC 119 – Application

- Step 1: CONTACT UTILITY

Obtain application and guidelines from electric provider.

- Step 2: FILL OUT FORM

Complete standard application form, PSC 6027 OR 6028.

PSC 119 – Application

- Step 3: Completeness check
 - *10 working days*
 - electric provider determines if application is complete.
- Step 4: Application review
 - *10 working days*
 -
 - cost determination for Engineering Review and Distribution System Study

PSC 119 – Application

Step 5 : Engineering Review

10,15,20,40 days

- if needed
- applicant pays the fee

Step 6 – Go or no-go decision

- If Distribution System Study is needed, utility will provide cost estimate.

PSC 119 – Application

- Step 7 - Distribution System Study

Category	Time Limit
1	10 working days
2	15 working days
3	20 working days
4	60 working days

PSC 119 – Application

Step 8: Installation

Time negotiated

- Utility completes system upgrades
- Applicant installs DG facility

PSC 119 – Application

Step 9 – Testing

Utility has 10 to 20 days to:

- Witness commissioning tests
- Verify protective equipment settings
- Verify anti-islanding test
- Or waive its right to verify or witness the test.

PSC 119 – Application

- Step 10: FINAL APPROVAL

5 to 10 working days

- The utility reviews test results and either approves interconnection or request changes.
- Standard interconnection agreement (PSC FORM 6029) is signed.

PSC 119 – Requirements

- ★ DG must automatically disconnect
- ★ Visible “interconnection disconnect switch”
- ★ Equipment must comply with appropriate UL and IEEE (p1547) standards
- ★ DG interconnection must have “Anti-islanding” protection
- ★ DG equipment that is type tested to UL 1741 (1/17/01) does not require further testing by utility

• QUESTIONS?









Madison PV Installation



D.G. Technologies - Solar

- Photovoltaic: Direct conversion of the sun's energy to electricity.
- Environmental: No air or water pollution.
Manufacturing?
- Siting Issues: Minimal
- Economics: \$8000 per kW / \$.30 to \$.40 per kWh

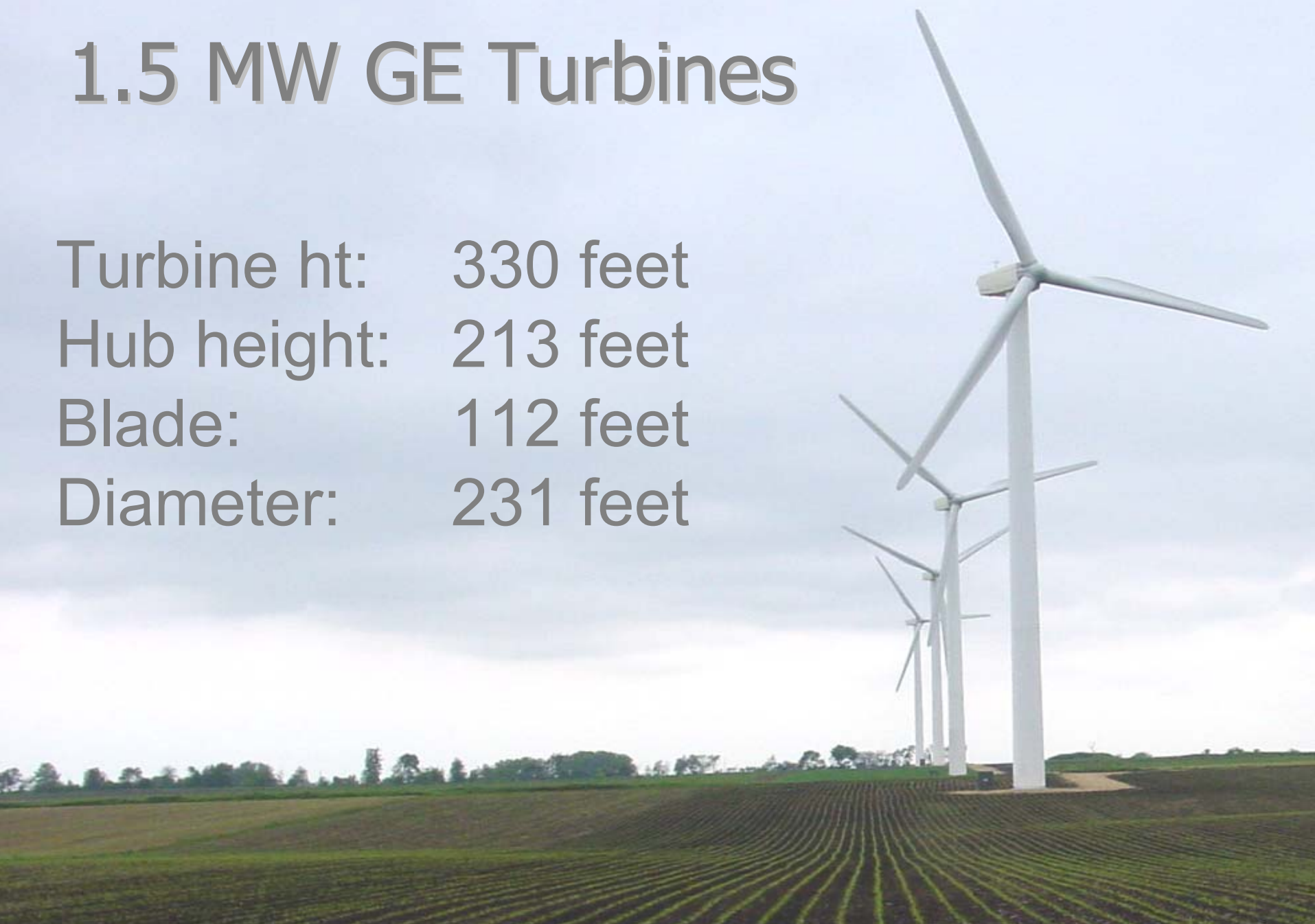
1.5 MW GE Turbines

Turbine ht: 330 feet

Hub height: 213 feet

Blade: 112 feet

Diameter: 231 feet



D.G. Technologies - Wind

- Technology: Uses kinetic energy in the wind to turn rotating electric generator.
- Environmental : No air or water pollution.
Bird and bat interaction.
- Siting Issues: Public concerns about aesthetics, noise, and property values.
- Economics: Depends on average wind speed – 5.0 to 10.0 cents per kWh.

D.G. Technologies - Biogas

- Technology: Uses methane and other gases from landfills and anaerobic digesters to fuel microturbine or IC engine and turn rotating electric generator.
- Environmental: Does produce some air emission, but reduce odors.
- Siting Issues: Aesthetics, noise, and property values can be issues with associated facility.
- Economics: 2.5 to 10.0 cents per kWh depending on size.

